

ANESTESIA Y GERIATRÍA

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INTRODUCCIÓN

- En USA: 50% cirugías en > 65 años.
- Incidencia de complicaciones neurológicas (15%), pulmonares (7%) y cardiacas (12%) en el postop. anciano.



..... OBJETIVO MEDICINA PERIOPERATORIA EN EL ANCIANO: **el anciano vuelve a su situación pre-IQ**



TIPOS DE PACIENTE ANCIANO

ANCIANO SANO	Edad avanzada No enfermedades objetivables. No deterioro funcional – Independiente No alteraciones mentales No problemática social
ANCIANO ENFERMO	Anciano sano con enfermedad aguda. Comportamiento similar a adultos no ancianos. No suelen presentar otras enfermedades importantes. No suelen presentar deterioro funcional, mental ni social asociado. Manejo “tradicional”
ANCIANO FRÁGIL	Edad avanzada Enfermedades crónicas de base que cuando están compensadas permiten al anciano mantener su independencia básica (situación de prediscapacidad) Delicado equilibrio del entorno socio – familiar Con proceso agudo intercurrente: - Alto riesgo de deterioro funcional - Mayor riesgo de síndrome confusional - Alto riesgo de desequilibrio social Puede llevar a una pérdida de independencia con necesidad de recursos sanitarios o sociales.
PACIENTE GERIÁTRICO	Edad avanzada Una o varias enfermedades crónicas de base evolucionadas Deterioro funcional – Dependientes para ABVD en mayor o menor grado Alteraciones mentales frecuentes. Necesidad de asistencia domiciliaria / medio residencial.



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FRAILTY SCORE: OPERATIONAL DEFINITION⁸⁹

Criteria	Definition
Shrinkage	Unintentional weight loss ≥ 10 pounds in past year
Weakness	Decreased grip strength
Exhaustion	Self-reported poor energy and endurance
Low physical activity	Low weekly energy expenditure
Slowness	Slow walking

Interpretation of the Frailty Score

The patient receives 1 point for each criterion met.

0–1 = Not Frail

2–3 = Intermediate Frail (Pre-frail)

4–5 = Frail

Frail patients are at much higher risk of adverse health outcomes.

Intermediate frail patients are at elevated risk (less than frail ones) but are also at more than double the risk of becoming frail over three years.

Dominio		Variable	Descripción	Puntos
Funcional	AIVDs	Manejo de dinero	¿Necesita ayuda para gestionar los asuntos económicos (banco, tiendas, restaurantes)?	Si: 1 No: 0
		Utilización de teléfono	¿Necesita ayuda para utilizar el teléfono?	Si: 1 No: 0
		Control de medicación	¿Necesita ayuda para la preparación/administración de la medicación?	Si: 1 No: 0
	ABVDs	Índice de Barthel (IB)	¿No dependencia (IB ≥ 95)?	0
			¿Dependencia leve-moderada (IB 90-95)?	1
			¿Dependencia moderada-grave (IB 60-25)?	2
			¿Dependencia absoluta (IB ≤ 20)?	3
Nutricional	Malnutrición	¿Ha perdido ≥ 5% de peso en los últimos 6 meses?	Si: 1 No: 0	
Cognitivo	Grado de deterioro cognitivo	¿Ausencia de deterioro cognitivo?	0	
		¿De Lo cognitivo leve-moderado (equivalente a GDS ≤ 5)?	1	
		¿De Lo cognitivo grave-muy grave (equivalente a GDS ≥ 6)?	2	
Emocional	Síndrome depresivo	¿Necesita de medicación antidepresiva?	Si: 1 No: 0	
	Insomnio/ansiedad	¿Necesita tratamiento habitual con benzodiazepinas u otros psicofármacos de perfil sedante para el insomnio/ansiedad?	Si: 1 No: 0	
Social	Vulnerabilidad social	¿Existe percepción por parte de los profesionales de situación de vulnerabilidad social?	Si: 1 No: 0	
Síndromes Geriátricos	Delirium	En los últimos 6 meses, ¿ha presentado delirium y/o trastorno de comportamiento, que ha requerido de neurológicos?	Si: 1 No: 0	
	Caidas	En los últimos 6 meses, ¿ha presentado ≥ 2 caídas o alguna caída que haya requerido hospitalización?	Si: 1 No: 0	
	Úlceras	¿Presenta alguna úlcera (por decúbito o vascular, de cualquier grado)?	Si: 1 No: 0	
	Polifarmacia	¿habitualmente, toma ≥ 5 fármacos?	Si: 1 No: 0	
	Disfagia	¿se atraganta frecuentemente cuando come o bebe? En los últimos 6 meses, ¿ha presentado alguna infección respiratoria por broncoaspiración?	Si: 1 No: 0	
Síntomas graves	Dolor	¿requiere de ≥ 2 analgésicos convencionales y/o opiáceos mayores para el control del dolor?	Si: 1 No: 0	
	Disnea	¿la disnea basal le impide salir de casa y/o que requiera de opiáceos habitualmente?	Si: 1 No: 0	
Enfermedades (+)	Cáncer	¿Tiene algún tipo de enfermedad oncológica activa?	Si: 1 No: 0	
	Respiratorias	¿Tiene algún tipo de enfermedad respiratoria crónica (EPOC, neumopatía restrictiva,...)?	Si: 1 No: 0	
	Cardíacas	¿Tiene algún tipo de enfermedad cardíaca crónica (insuficiencia cardíaca, cardiopatía isquémica,...)?	Si: 1 No: 0	
	Neurológicas	¿Tiene algún tipo de enfermedad neurodegenerativa (E. de Parkinson, ELA, ...)?	Si: 1 No: 0	
	Hepáticas	¿Tiene algún tipo de enfermedad hepática crónica (hepatopatía, cirrosis,...)?	Si: 1 No: 0	
	Renales	¿Tiene insuficiencia renal crónica (FG <60)?	Si: 1 No: 0	

Índice Frágil-VIG = $\frac{X}{25}$

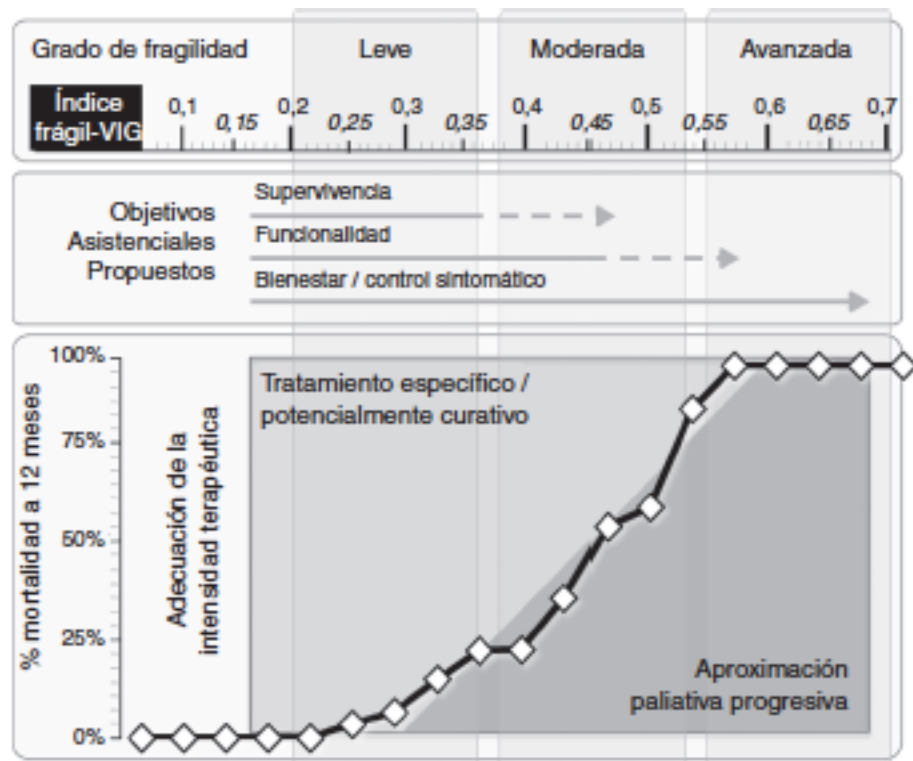


Figura 4. Modelo conceptual que resume gráficamente cómo el índice frágil-VIG facilita el diagnóstico situacional y la propuesta de objetivos asistenciales/ adecuación de la intensidad terapéutica.

ÍNDICE DE BARTHEL

Puntuación: 0 - 100,
< 20: dependencia total
20 – 35; dependencia grave
40 – 55; dependencia moderada
>60; dependencia leve

Confiere valor predictivo sobre:

- mortalidad
- ingreso hospitalario,
- duración de estancia en unidades
- de rehabilitación
- ubicación al alta de pacientes con accidente cerebrovascular.

BAÑO	5-independiente 0-dependiente	
VESTIRSE	10-independiente 5-ayuda 0-dependiente	
ASEARSE	5-independiente 0-dependiente	
IR AL RETRETE	10-independiente 5-ayuda 0-dependiente	
DEAMBULACIÓN	15-independiente 10-min. Ayuda 5-ind. Silla de ruedas 0-dependiente	
TRASLADO SILLÓN CAMA	15-independiente 10- min. ayuda 5-gran ayuda 0-dependiente	
ESCALONES	10-independiente 5-ayuda 0-dependiente	
MICCIÓN	10-Continente 5-inc. ocasional 0-incontinente	
DEPOSICIONES	10-Continente 5-inc. ocasional 0-incontinente	
ALIMENTACIÓN	10-independiente 5-ayuda 0-dependiente	

SD. GERIÁTRICOS

Son situaciones de enfermedad expresadas por un conjunto de síntomas y fuente de incapacidad funcional/social.

- ***Inmobility***
- ***Inestability*** (caídas)
- ***Incontinence***
- ***Intellectual impairment*** (demencia + delirium)
- ***Inanition***
- ***Inmune deficiency***
- ***Infection***
- ***Irritable colon*** (estreñimiento + fecalomas)
- ***Impairment of vision and hearing***
- ***Isolation***(depression)/***insomnio***
- ***Iatrogenesis***
- ***Impotence***

SCREENING FOR SEVERE NUTRITIONAL RISK⁹⁵

Risk Factors for Severe Nutritional Risk

- BMI <18.5 kg/m²
- Serum albumin <3.0 g/dL (with no evidence of hepatic or renal dysfunction)
- Unintentional weight loss >10%–15% within 6 months

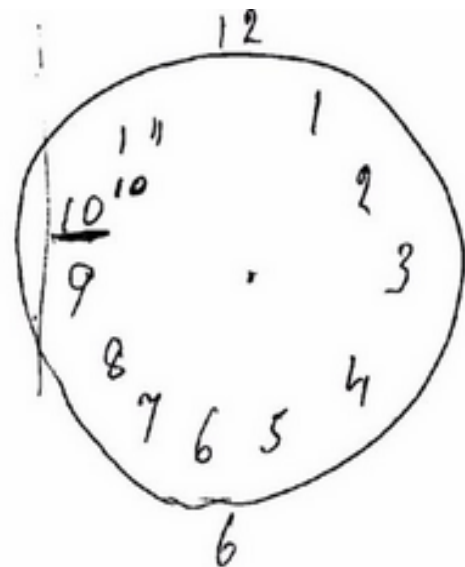
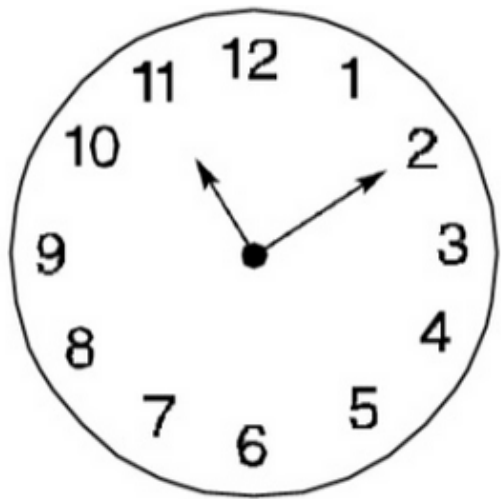
Interpretation of Nutritional Screening

If YES to any above criterion, then the patient is at severe nutritional risk and should, if feasible, undergo a full nutritional assessment by a dietician to design a perioperative nutritional plan to address deficits.

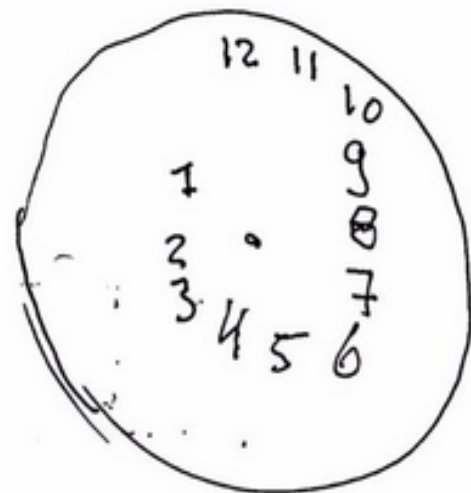
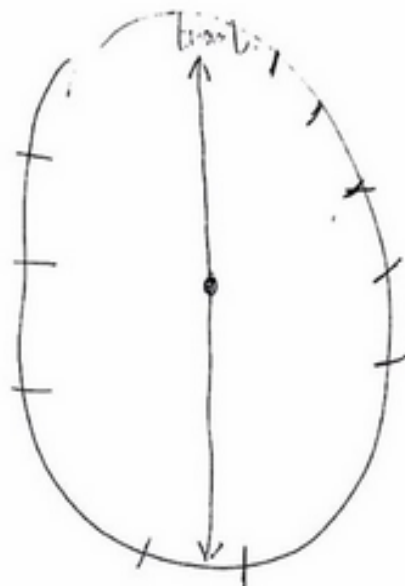
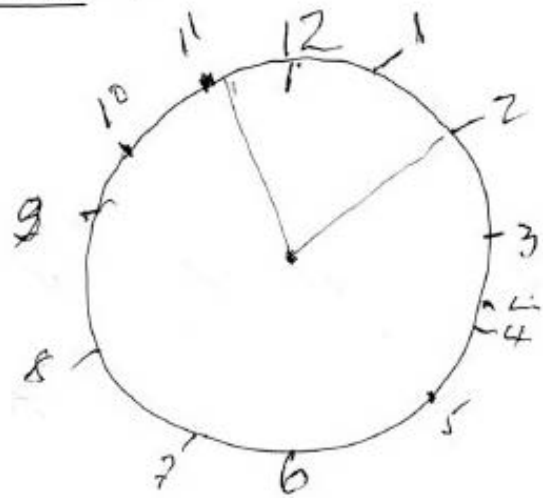
PREOPERATIVE INTERVENTIONS FOR MALNUTRITION

ESPEN Recommendations^{95,126}

- Use nutritional support in patients with severe nutritional risk for 10–14 days prior to a major surgical operation even if the operation has to be delayed (Grade A).
- Initiate nutritional support (by the enteral route if possible) without delay:
 - Even in patients without obvious under-nutrition, if it is anticipated that the patient will be unable to eat for more than 7 days perioperatively (Grade C).
 - In patients who cannot maintain oral intake above 60% of recommended intake for more than 10 days (Grade C).
- Consider combination with parenteral nutrition in patients in whom there is an indication for nutritional support and in whom energy needs cannot be met (<60% of caloric requirement) via the enteral route (Grade C).
- Encourage patients who do not meet their energy needs from normal food to take oral nutritional supplements during the preoperative period (Grade C).
- Administer preoperative enteral nutrition preferably before admission to the hospital (Grade C).
- Preoperative parenteral nutrition is indicated in severely undernourished patients who cannot be adequately orally or enterally fed for 7–10 days preoperatively (Grade A).



11:10



ESTADIO	FASE CLÍNICA	MEC	GDS-FAST	CARACTERÍSTICAS
1. No DC	Normal	30-35	No DF, objetivos o subjetivos	No DC , subjetivo ni objetivo
2. DC muy leve	Normal para su edad. Olvidos.	25-30	DF subjetivo	- Quejas de pérdida de memoria en ubicación de objetos, nombres de personas, sitas... - No D objetivable en examen clínico ni en su medio laboral ni en situaciones sociales. - Hay pleno conocimiento y valoración de la sintomatología
3. DC leve	Deterioro límite	20-27	D en tareas ocupacionales y sociales complejas y que generalmente lo observan los familiares y amigos	- Primeros defectos claros. Se manifiesta en una o más de estas áreas: • Haberse perdido en un lugar no familiar • Evidencia de rendimiento laboral pobre • Dificultad para recordar palabras y nombres • Tras la lectura retiene escaso material • Olvida la ubicación, pierde o coloca erróneamente objetos de valor • Escasa capacidad para recordar a personas nuevas que ha conocido. - D de concentración evidente en entrevista clínica exhaustiva - Ansiedad leve-moderada. Negación.
4. DC moderado	EA leve	16-23	D observable en tareas complejas (control aspectos económicos personales o planificación de comidas cuando hay invitados)	Defectos manifiestos en: • Olvido de hechos cotidianos o recientes • Déficit en el recuerdo de su historia personal • Dificultad de concentración evidente en operaciones de resta de 7 en 7 • Incapacidad para planificar viajes, finanzas o actividades complejas Frecuentemente NO defectos en: • Orientación en T y P • Reconocimiento de caras y personas familiares • Capacidad de viajar a lugares conocidos Labilidad afectiva
5. DC mod-grave	EA mod	10-19	< habilidad en escoger la ropa adecuada para cada estación del año o según las ocasiones	- Necesita asistencia en determinadas tareas (elegir ropa), no en el aseo ni en la comida - Es incapaz de recordar aspectos importantes de su vida cotidiana (dirección, teléfono, nombres de familiares) - Es frecuente cierta desorientación en T o E - Dificultad para contar en orden inverso desde 40 de 4 en 4, o desde 20 de 2 en 2 - Sabe su nombre y generalmente el de su esposa e hijos
6. DC grave	EA mod-grave	0-12	5 subestadios: - < hab para Vestirse sólo - < hab para Bañarse sólo - < hab para Lavarse-Asearse sólo -IU -IF	- Olvida a veces el nombre de su esposa, de quién depende para vivir - Retiene algunos datos del pasado - Desorientación T-E - Dificultad para contar de 10 en 10 en orden inverso o directo - Puede necesitar asistencia para las AVD - Puede presentar incontinencia - Recuerda su nombre y diferencia a los familiares de los desconocidos - Ritmo diurno frecuentemente alterado - Cambios personalidad y afectividad (delirio, sint. obsesivos, ansiedad, agitación o agresividad y abulia cognoscitiva)
7. DC muy grave	EA grave	0	Pérdida del habla y de la capacidad motora. 6 subestadios: A: habla +- 6 palabras B: habla 1 palabra única C: No camina solo sin ayuda D: No se sienta y se levanta sin ayuda E: No sonrío F: No mantiene la cabeza erguida	- Pérdida progresiva de todas las capacidades verbales y funciones psicomotoras como la deambulación - IU - Necesidad de asistencia en la higiene personal y alimentación - Con frecuencia signos neurológicos

FACTORES QUE MODIFICAN LA RESPUESTA FARMACOLÓGICA DEL ANCIANO

- CAMBIOS FISIOLÓGICOS y MODIFICACIONES F-cinéticas y F-dinámicas
- PLURIPATOLOGÍA

**> CONSUMO FÁRMACOS: RAM + INTERACCIONES
INCUMPLIMIENTO
AUTOMEDICACIÓN**

- FACT. PSICO-SOCIALES

STEMA CARDIO-VASCULAR (1)

- ↓ producción **ELASTINA** -- ↑ producción **COLÁGENO** (<flexible)

<< retracción elástica y << distensibilidad

- ✓ HTA sistólica
- ✓ ↓ PA diastólica = ↓ flujo coronario

- ✓ HF miocardio
- ✓ ↑ Postcarga VI

***Prolonga la contracción miocardio
y retrasa la relajación***

- Función anormal del endotelio -- ↓ producción **N.O.**

↑ ↑ estrés oxidativo y daño microcirculación.

STEMA CARDIO-VASCULAR (2)

- **RIGIDEZ VENOSA** = ↓ capac. mantener **PRECARGA CONSTANTE**
- ↓ respuesta **baro-R** + ↓ **SN PS** (tono vagal)
- ↑ **SN S** (NAD) = **VC arteriolar** y ↑ **RVS**
- ↓ respuesta R **β –adrenérgicos miocárdicos**

----- para mantener IC -----

Ley de Frank-Starling: “Cuanto más se distiende el miocardio durante el llenado, mayor será la cantidad de sangre bombeada”.

- **ICC DIASTÓLICA.** La FEVI se mantiene.

STEMA CARDIO-VASCULAR (3)

- **TR. CONDUCCIÓN**

- En **NS**: ↓ n° céls. marcapasos + fibrosis + grasa --- ↓ **FC**
- En **nodo AV**: calcificación del esqueleto fibroso cardiaco
- Depósitos amiloide aurícula --- **bloqueos + arritmias (FA)**

STEMA CARDIO-VASCULAR (4)

Table 2 Changes in the cardiovascular system with age			
Cardiac Changes		Vascular Changes	
Heart weight	▲	Arterial wall thickness	▲
Cardiomyocyte number	▼	Elastin	▼
Collagen cross-linking	▲	Elastin fragmentation	▲
Early diastolic filling	▼	Arterial distensibility	▼
End-diastolic filling	▲	Pulse wave velocity	▲
Chronotropic responsiveness to beta-agonists	▼	Total peripheral resistance	▲
Inotropic responsiveness to beta-agonists	▼	Endothelial function	▼

▲, Augmented; ▼, diminished.

>> hTA y labilidad TA durante la anestesia

STEMA CARDIO-VASCULAR (5). COMPLICACIONES.

FR PREDICTORES DE COMPLICACIÓN CARDIACA

- **Edad > 65 a**
- **IMC >30**
- **Cirugía emergente**
- **ICC activa**
- **Cir. cardiaca previa**
- **Enf. cerebro-vascular**
- **HTA**
- **Cirugía >3,8h**
- **Transfusión sanguínea intraop.**

STEMA CARDIO-VASCULAR (6). COMPLICACIONES.

RECOMENDACIONES

1. **β -BLOQUEANTES:** mantenerlos perioperat. si cr. **β -b cr** (LE 1)
2. **ESTATINAS.** Suspensión asociada a \uparrow R de IAM/muerte.
3. **CONTROL DE HTA.** Evitar interrumpir tto anti-HTA. *Controvertidos preop. ARA II-IECAs (individualizar !). Reintroducir precoz postop.*

Uptodate. Revisión enero 2018.

1. MANEJO DE LA T^a

- > vulnerables: RTU, cir. abierta urológica y artroscopia hombro.
- “Forced-air warming system” + manta eléctrica.
- Cascada de aire caliente > humidificadores TET.

STEMA NERVIOSO (1). SNC

Brain volume	▼	Blood-brain barrier permeability	▲
Dopamine levels	▼	Arterial wall thickness	▲
Cerebral metabolic rate	▼	Monoamine oxidase activity	▲

- **Córtex prefrontal** > LT > cerebelo > hipocampo – ALT. COGNITIVAS
- Pérdida sust. blanca > sust. gris
- ↓ metab. cerebral (consumo O₂)
- ↓ n° y función R de NT: ACh, DOPA y SEROTONINA
- ↑ **permeabilidad BHE** - cambios NT
- Cambios R del **GABA** --- *propofol / etomidato / BZD* y **NMDA** --- *ketamina*

STEMA NERVIOSO (8). DEMENCIA. IACEs

Característica	Donepezilo	Rivastigmina	Galantamina	Memantina
Precauciones	Asma/EPOC Bradicardia	Úlcus gastro-duodenal activo, Enfermedad del seno, retención urinaria	Asma/EPOC Intervenciones quirúrgicas	Insuficiencia renal moderada, epilepsia, insuficiencia cardíaca III-IV, infarto miocárdico reciente
Contraindicado	Úlcus gastro-duodenal activo, Enfermedad del seno, retención urinaria	Insuficiencia hepática grave	Insuficiencia hepática o renal grave Enfermedad del seno	Riesgo de psicosis si se administra con: Dextrometorfano Amantadina Fenitoína L-Dopa Reduce el efecto de: Neurolépticos, Baclofeno, Cimetidina, Ranitidina, Nicotina
Interacciones farmacológicas	Ketoconazol, Itraconazol Fluoxetina Rifampicina Fenitoína Carbamazepina Alcohol Betabloqueantes	No descritas	Atropina Betabloqueantes Digoxina Paroxetina Ketoconazol	
Relación con las comidas	Indiferente (habitualmente se administra por la noche)	Administrar con las comidas	Administrar con las comidas. Asegurar adecuada ingesta de líquidos	Indiferente
Controles analíticos	No necesarios	No necesarios	No necesarios	No necesarios




STEMA NERVIOSO (2)

- **Alt. μ vasc. cerebral** “*intimal thickening*” – **ARTERIOSCLEROSIS** y \downarrow **FSC**
- \downarrow **LCR**, \downarrow **tamaño esp. epidural**, \uparrow **permeabilidad dural**, \downarrow **mielina nervios** y \downarrow **nº raíces nerv.**

<< **REQUERIMIENTOS FARMACOS IV, INH, AL**

- **IMPORTANTE:** **BIS = PROFUNDIDAD ANESTESICA \neq EDAD**

STEMA NERVIOSO (3). SN.AUTÓNOMO

- < TERMORREGULACIÓN -----  ↓ **T^a**
- ↓ CAPAC. RESPUESTA a ↓ pO₂ ↑ pCO₂ (taq + ↑ IC + hiperventilación)
-----   ↑ **eO₂ tisular**
- ↑ Síntesis catecolaminas = ↑ NAD_{sg} con < **resp. autonómica órganos**
“ *estado de β-bloqueo periférico*”.

ANESTESIA (AG/NEUROAXIAL) se pierde CONTROL AUTONÓMICO
de las funciones vitales !!

 ↓ **TA**

STEMA NERVIOSO (6). SD. CONFUSIONAL AG (POD).

POD (POSTOPERATIVE DELIRIUM) ≠ POCD (POSTOPERATIVE COGNITIVE DYSFUNCTION)

HIPERACTIVO / HIPOACTIVO (>mortalidad) / MIXTO

- Incidencia 10% anciano (↑ 30-65%)
- Aparece a las 24-72h. cirugía.
- ↑ estancia media, dependencia al alta y carga de cuidados.
- Asociación con POCD a los 12m. y DEMENCIA a los 5a.

STEMA NERVIOSO (5). SD. CONFUSIONAL AG.

Table 3 The confusion assessment method (CAM) diagnostic algorithm adapted from Inouye et al. [89].

Feature 1	Acute onset and fluctuating course This feature is usually obtained from a family member or nurse and is shown by positive responses to the following questions: is there evidence of acute change in mental status from the patient's baseline? Did the (abnormal) behaviour fluctuate during the day, that is, tend to come and go, or increase and decrease in severity?
Feature 2	Inattention This feature is shown by a positive response to the following question: did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?
Feature 3	Disorganised thinking This feature is shown by a positive response to the following question: was the patient's thinking disorganised or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?
Feature 4	Altered level of consciousness This feature is shown by any answer other than 'alert' to the following question: overall, how would you rate this patient's level of consciousness? (alert [normal]), vigilant (hyperalert), lethargic [drowsy, easily aroused], stupor [difficult to rouse] or coma [unrousable])

The diagnosis of delirium by CAM requires the presence of features 1 and 2 and either 3 or 4

DSM-5 criteria

A disturbance in attention (i.e. reduced ability to direct, focus, sustain and shift attention) and awareness (reduced orientation to the environment)

The disturbance develops over a short period of time (usually hours to a few days), represents a change from baseline attention and awareness, and tends to fluctuate in severity during the course of a day

An additional disturbance in cognition (e.g. memory deficit, disorientation, language, visuospatial ability or perception)

The disturbances in criteria a and c are not better explained by another preexisting, established or evolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma

There is evidence from the history, physical examination or laboratory findings that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal (i.e. due to a drug of abuse or to a medication), or exposure to a toxin, or is due to multiple aetiologies

STEMA NERVIOSO (6). SD. CONFUSIONAL AG.

FISIOPATOLOGIA:

Table 1 Predisposing factors and possible mechanisms for the development of postoperative delirium/cognitive deterioration in elderly patients.

Predisposing factors

Cerebral	Structural changes <ul style="list-style-type: none">● decreased whole-brain volume● blood-brain barrier damage● reduction of neurogenesis● hippocampal changes● amyloid or tau accumulation Brain inflammation Cerebrovascular disease Disturbances in levels of neurotransmitters Pre-operative cognitive impairment Reduction in cognitive reserve
Systemic	Advanced age <ul style="list-style-type: none">● increased frailty● increased incidence of pre-existing illness● increased incidence of polypharmacy Systemic vascular disease
Social	Lower educational level

Potential mechanisms

Neurohumoral inflammatory surgical stress response
Thromboembolism
Direct anaesthetic agent toxicity
Ischaemia (hypoperfusion, hypoxaemia)
Polypharmacy
Hospital environment

Pre-operative Assessment

A: (low risk and high risk patients)

- Avoid benzodiazepines for premedication except anxiety
- Avoid anticholinergic drugs
- Minimum fluid fasting time

B: (High risk (addition/set A obligatory))

- Consider alpha-2 agonists
- Maintain day-night rhythm

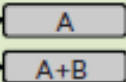


Anaesthesia

A: (low risk and high risk patients)

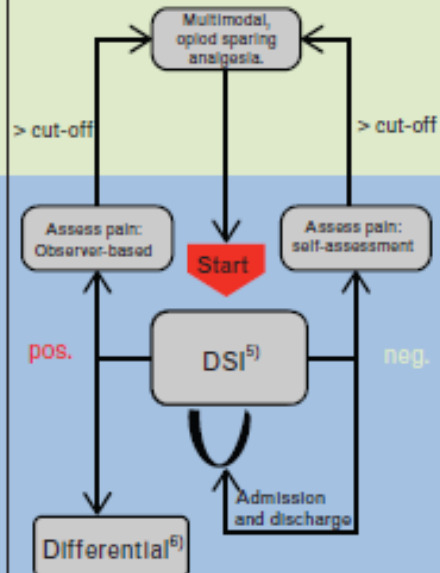
- Avoid benzodiazepines (except withdrawal)
- Adequate pain control (multimodal continuous infusion of opioids)

A + B: High risk (additional/set A obligatory) s.t.A



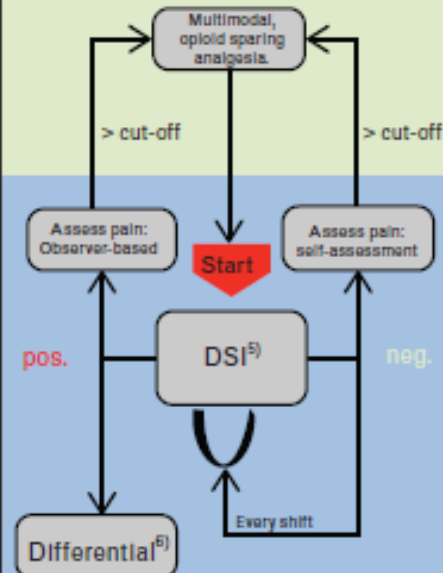
Recovery room

All patients: Non-pharmacological prevention⁴⁾



Ward

All patients: Non-pharmacological prevention⁴⁾



All patients: Monitoring of anaesthesia depth: Avoid too deep anaesthesia⁴⁾

Start → Check for risk-factors¹⁾

Risk¹⁾

High risk

Detailed Pre-assessment⁵⁾

Detailed Post-assessment⁵⁾

Treat underlying cause, if possible. Symptom-orientated pharmacotherapy:

- Titrate haloperidol (0.25 mg-wise, max 3.5 mg)
- Use alternatively low dose atypic neuroleptics

Treat underlying cause, if possible. Symptom-orientated pharmacotherapy:

- Titrate haloperidol (0.25 mg-wise, max 3.5 mg)
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Prevention

Monitoring

Therapy

Pre-operative Assessment

Anaesthesia

Recovery room

Ward

Table 8 Evidence-based and consensus-based statements regarding prevention and treatment

Statement	LoE	Age group (inclusion criteria)		GoR
		All adults	≥65 years	
We suggest implementing fast-track surgery to prevent POD	[158], 1b; [159], 2b; [193], 2b; [193], 2b	[159,193]	[158,194]	B
We suggest avoiding routine premedication with benzodiazepines except for patients with severe anxiety	[10], 2b; [105], 5; [195], 2b; [196], 3b; [197], NR; [198], 2b; [204], 2b		[10], Incl. none, POD+, 67.7 years, POD-, 50 years; [105,195,196], >60% were ≥65 years; [197]; [199] mean age 66.8 years and range 43-87 years	B
We recommend monitoring depth of anaesthesia	[105], 5; [199], 1b; [200], 1b; [201], 1b; [202], 1b	[199-201]	[105,202]	A
We recommend adequate pain assessment and treatment	[103], 2b; [153], 1b; [197], NR; [203], 4; [205], 2b; [206], (SR)	[202]	[103,153,197,199,205]	A
We suggest using a continuous intraoperative analgesia regimen (e.g. with remifentanyl)	[13], 2b; [207], 2b	[13,207]		B
We recommend promptly diagnosing POD, establishing a differential diagnosis, and instituting treatment	[37], 2b; [38], 2b; [179], 2b; [208], Consensus review	[37]	[38,179,208]	A
We suggest using low-dose haloperidol ^P or low-dose atypical neuroleptics to treat POD	[208], 5; [209], SR; [210], 2b; [211], 2b	[208,209]	[211,212]	B

Symptom-oriented pharmacotherapy:
 • Titrate haloperidol (0.25 mg-wise, max 3.5 mg)
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Prevention

Monitoring

Therapy

t-off

nt

eg.

nt⁽⁵⁾

STEMA NERVIOSO (9). SD. CONFUSIONAL AG.

RECOMENDACIONES

1. Evitar innecesaria profundidad anestésica
2. Evitar fluctuaciones PA intraop.
3. Si reposición volémica intensiva: monitorizar función cardiaca y presencia de FA.
4. Evitar/tratar depresión respiratoria y/o hipoxia. Corrección cifras lab.
5. Detección / tto dolor postop. (ojo opioides / **NO** meperidina).
6. Evitar polifarmacia.
7. Soporte NO farmacológico + valoración multidisciplinar (protocolos)

RESPIRATORIO (1)

- **Alt. propiedades mecánicas caja torácica:** ↓ compliante (+ rígida) --
- respiración diafragmática
- **Cambios VA superior:**
 - Falta fuerza musc. (soporte faríngeo) -- ↑ **R obstrucción VA**
 - Compromiso de reflejos de protección VA -- ↑ **R ASPIRACIÓN**
- **Alt. parénquima pulm:** ↓ n° **fibras elásticas** (↓ retracción elástica): ↓
Vol. pulm. y capacidades -- ↓ CVF ↓ FEV₁ ↓ superf. alveolar total
(enfisema funcional) ↑ VR
- **Cierre precoz de la pequeña VA**

RESPIRATORIO (2)

- ↓ **SatO₂** (↓ pO₂ 3-5%/ década)
- ↓ capac. **difusión** pulmonar
- ↓ **50% respuesta a hipoxia / hipercapnia** (sensib. qR)

Alt. V/Q
↑ gde A-a O₂

ESTRATEGIA VENTILACIÓN: < Vt y > FR para compensar alt. intercambio gaseoso

- BLOQ. RESIDUAL BMND (+↓ compliance pared torác. +↓ fuerza musc. + ↓ resp. ↓pO₂/↑pCO₂) = **HIPOVENTILACIÓN**
- DOLOR + ↓ NC + INMOV. (↓expansión pulmonar) = **ATELECTASIAS**

FATIGA MUSC – HIPOXIA – ASPIRACIÓN - CLAUDIC.RESP - INFECCIONES

RESPIRATORIO (3). ANESTESIA GENERAL.

Tras la INDUCCION:

- Desplazamiento cefálico diafragma = ↓ **Vol. Intratorácico**
- **Atelectasias**
- ↓ **vc** pulmonar hipóxica

Tras la EDUCCIÓN: ↑ **TRABAJO RESPIRATORIO**

HIPOXEMIA PERIOPERATORIA y AG (hasta 5 días)

IMPORTANTE: analgesia + O₂ + mov. precoz +/- fisio resp.

RESPIRATORIO (4). COMPLICACIONES.

EDAD per sé es un FR significativo para complicaciones respirat.

- FR con buena evidencia de complic. respirat. en cir. no cardiaca

Smetana GW. Preoperative pulmonary update. Clin Geriatr Med 2008.

Qaseem A. Risk assessment for and strategies to reduce perioperative pulmonary complications for patients undergoing non cardiothoracic surgery: a guideline from the American College of Physicians. Ann Intern Med. 2006.

EDAD. ASA > II
ICC. EPOC.
Dependencia funcional

Cir. abd. sup (13-33%) > inf (1-6%)
Cir. Ao abd. y torácica
Cir. emergente
Duración IQ >3h
AG
Múltiples transfusiones

RESEARCH

Open Access



What are the optimum components in a care bundle aimed at reducing post-operative pulmonary complications in high-risk patients?

Table 1 Table to demonstrate the components included in the CB and those which were not chosen by the Delphi consensus

	Pre-operative	Intra-operative	Post-operative
In the care bundle	<ul style="list-style-type: none">• Supervised exercise programme• Inspiratory muscle training (†)	<ul style="list-style-type: none">• Low tidal volume ventilation (**) with individualised PEEP• Use of routine monitoring to avoid hyperoxia• Limit NM blockade	<ul style="list-style-type: none">• Deep breathing exercises• Mandatory elevation of the head of the bed
Not in the care bundle	<ul style="list-style-type: none">• Oropharyngeal decontamination• Oral care package• Chlorhexidine mouthwash or other selective oral decontamination• Selective digestive decontamination• Incentive spirometry• Deep breathing exercises• Daily pedometer targets	<ul style="list-style-type: none">• Recruitment manoeuvres• Routine use of high levels of PEEP• Use of endotracheal tubes with specific design features, including subglottic secretion drainage• Specific drugs or techniques to limit residual neuromuscular blockade	<ul style="list-style-type: none">• Prophylactic ventilator support including CPAP, NIV or high-flow nasal oxygen• Pharmacological therapies that aim to decrease gastro-oesophageal reflux

A recommendation with (†) moderate quality or (**) strong quality evidence using GRADE or Jadad criteria

RESPIRATORIO (5). COMPLICACIONES.

RECOMENDACIONES

1. Evitar RMND de $t_{1/2}$ larga
2. Buen control dolor postop. (**NO** evidencia AG vs AR como técn. anest. intraop). *Anal. epidural para IQ aórtica, abd. sup y torácica.*
3. Maniobras para ↓ atelectasias : espirometría incentivada, ejerc. inspiración profunda, CPAP.
4. Tener en cuenta el R ↑ de aspiración (pac. NRL – ojo sedantes !!).
5. Tromboprofilaxis

RENAL (1)

- Cambios red vasc. renal (\downarrow FSR 10%/ década) **>> HTA / DM**
- Atrofia renal + \downarrow n^o nefronas --- \downarrow **HCO₃⁻** y \downarrow **EPO**
- FG: \downarrow Cl. Cr \downarrow **ACLARAMIENTO FÁRMACOS** ($>t_{1/2}$ y $>$ niveles)
- \uparrow susceptibilidad a insultos renales = IRAg. perioperat.
- \downarrow sensación de sed
- Eje RAA: \downarrow Activ. renina plasmática (>60 a) y \downarrow ADH
- Afect. homeostasis de electrolitos (respuesta + lenta a cambios Na⁺ / $<$ concentrar orina) -- \downarrow **AUTORREGULACIÓN VOL. CORPORAL**

RENAL (2). CALCULO FG

www.senefro.org/modules.php?name=calcfg

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S.E.N. Sociedad Española de Nefrología

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ESTIMACIÓN DEL FILTRADO GLOMERULAR MD R / CKD-EPI

Creatinina (mg/dL)

Sexo:

Hombre

Edad (años)

Metodología

CKD-EPI

CALCULAR

RESETEAR

Si desea descargar la aplicación de la calculadora por favor haga click [aquí](#)

RENAL (3). COMPLICACIONES.

RECOMENDACIONES

1. Evitar deshidratación / sobrecarga hídrica: realizar balances / peso diario +/- monitorización no invasiva volemia.
2. Pedir niveles de fármacos
3. Ajustar ATB a función renal
4. Evitar en lo posible F nefrotóxicos (AINEs)
5. Correcto uso de diuréticos

AP. GASTRO-INTESTINAL

- ↓ Amplitud contracciones esófago y ↓ n^o ondas peristálticas ---
PROLONGADO VACIADO GASTRICO --- ↑ R ASPIRACIÓN ---
- Gastritis atrófica
- Función **pancreática**:
 - Exocrina: se mantiene
 - Endocrina: ↓ prod. INSULINA cels. β + ↑ resistencia INSULINA
- **Hígado**: vol. ↓ 20-40% -- ↓ flujo sg. hepático 10%/ década
Se mantienen síntesis Alb. y Fact. coag.
Alt. reacciones **fase I** (Cit P₄₅₀) y muy afectadas por polifarmacia.
↑ R de RAM

FUNCIÓN SANGUÍNEA E INMUNE (1).

TROMBOSIS

- ↓ capac. fibrinolisis
- ↑ Fact. Coag: V, VII, VIII, IX, X, XII
- ↓ antitrombina III
- ↑ hemostasia mediada por plaquetas

INFECCIONES y FENs. AUTOINMUNES

- ↓ activ. Linfos B y T

FUNCIÓN SANGUÍNEA E INMUNE (2). ANEMIA

THE NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

Dan L. Longo, M.D., Editor

Indications for and Adverse Effects of Red-Cell Transfusion

Jeffrey L. Carson, M.D., Darrell J. Triulzi, M.D., and Paul M. Ness, M.D.

31 estudios
>12.000 pac

Estrategia **RESTRICTIVA** (7-8 gr/dl) vs **LIBERAL**

- = MORTALIDAD 30 días y a largo plazo (3a) / neumonía / IAM / ICC
- SUBGRUPOS
 - Enf. cardio-vasc: LIBERAL - ↓ MORTALIDAD
 - Sangrado gastro-intest: RESTRICTIVA - ↓ MORTALIDAD y resangrado
 - Shock séptico: = MORTALIDAD
 - COT: = MORTALIDAD
- **RECOMENDACIÓN: Hb + valoración “clinical status”** (síntomas + HDM + tasa sangrado) + **oxigenación tisular.**

FUNCIÓN SANGUÍNEA E INMUNE (3).

ANEMIA y TRANSFUSIÓN

1. **The Transfusion Requirements In Frail Elderly (TRIFLE).** *Eur J Orthop Surg Traumatol 2015;25: 1031-8.*
 - Hb < **9,7** vs **11,3** – infección y FC (284) = NO DIF.
1. **A 2015 Cochrane review**
 - Hb **8**/síntomas de anemia vs **10** - FC (2.722, 81-87a) = NO DIF. MORBI-MORTALIDAD
1. **Transfusion Requirements After Cardiac Surgery (TRACS).** *Jama 2010;304(14).*
 - Hb **10,5** vs **9,1** (253, </> 60a) = NO DIF. MORBI-MORTALIDAD
 - ↑ Shock cardiogénico en RT >60a.

STUDY PROTOCOL

Open Access



Liberal transfusion strategy to prevent mortality and anaemia-associated, ischaemic events in elderly non-cardiac surgical patients – the study design of the LIBERAL-Trial

Abstract

Background: Perioperative anaemia leads to impaired oxygen supply with a risk of vital organ ischaemia. In healthy and fit individuals, anaemia can be compensated by several mechanisms. Elderly patients, however, have less compensatory mechanisms because of multiple co-morbidities and age-related decline of functional reserves. The purpose of the study is to evaluate whether elderly surgical patients may benefit from a liberal red blood cell (RBC) transfusion strategy compared to a restrictive transfusion strategy.

Methods: The LIBERAL Trial is a prospective, randomized, multicentre, controlled clinical phase IV trial randomising 2470 elderly (≥ 70 years) patients undergoing intermediate- or high-risk non-cardiac surgery. Registered patients will be randomised only if Haemoglobin (Hb) reaches ≤ 9 g/dl during surgery or within 3 days after surgery either to the LIBERAL group (transfusion of a single RBC unit when Hb ≤ 9 g/dl with a target range for the post-transfusion Hb level of 9–10.5 g/dl) or the RESTRICTIVE group (transfusion of a single RBC unit when Hb ≤ 7.5 g/dl with a target range for the post-transfusion Hb level of 7.5–9 g/dl). The intervention per patient will be followed until hospital discharge or up to 30 days after surgery, whichever occurs first. The primary efficacy outcome is defined as a composite of all-cause mortality, acute myocardial infarction, acute ischaemic stroke, acute kidney injury (stage III), acute mesenteric ischaemia and acute peripheral vascular ischaemia within 90 days after surgery. Infections requiring iv antibiotics with re-hospitalisation are assessed as important secondary endpoint. The primary endpoint will be analysed by logistic regression adjusting for age, cancer surgery (y/n), type of surgery (intermediate- or high-risk), and incorporating centres as random effect.

FUNCIÓN SANGUÍNEA E INMUNE (3).

MANEJO DE LIQUIDOS

Goal-directed intervention fluid (hemodynamic) therapy (GDHT): ↓ MORBI-MORTALIDAD en pacientes de alto riesgo quirúrgico.

Maintaining tissue perfusion in high-risk surgical patients: a systematic review of randomized clinical trials. Anesth Analg 2011; 112: 1384-91

A systematic review and meta-analysis on the use of preemptive hemodynamic intervention to improve postoperative outcomes in moderate and high-risk surgical patients. Anesth Analg 2011; 112: 1392-40

BMJ Open Stepped wedge cluster randomised controlled trial to assess the effectiveness of an optimisation strategy for general anaesthesia on postoperative morbidity and mortality in elderly patients (the OPTI-AGED study): a study protocol

Serge Molliex,¹ Sylvie Passot,¹ Emmanuel Futier,² Marlène Bonnefoi,³ Florence Rancon,³ Yannick Lemanach,⁴ Bruno Pereira⁵

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► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2017-021053>).

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ABSTRACT

Introduction Elderly patients constitute an increasingly large proportion of the high-risk surgical group. In adult patients, several specific intraoperative approaches such as cardiac output-guided haemodynamic therapy, depth of anaesthesia monitoring (DAM) or lung-protective ventilation (LPV) are designed to reduce postoperative mortality and surgical complications. However, none of these approaches has been specifically performed in the elderly, and no evaluation of a multimodal optimisation strategy for general anaesthesia has been achieved in this population.

Aims The objective of this study is to assess in high-risk patients aged 75 years and over undergoing high-risk surgery, the effectiveness of combined optimisation of anaesthesia involving goal-directed haemodynamic therapy (GDHT), LPV and electroencephalographic DAM on postoperative morbidity and mortality. The primary outcome of the study is a composite criterion associating major postoperative complications and mortality occurring within the 30 first postoperative days. The secondary outcomes are 1-year postoperative autonomy and mortality.

Strengths and limitations of this study

- The optimisation of general anaesthesia in aged (OPTI-AGED) trial is the first large study designed to investigate in elderly patients the effectiveness of a multifaceted optimisation of general anaesthesia involving haemodynamic intervention, lung-protective ventilation and electroencephalographic monitoring of anaesthesia depth.
- Major morbidities and mortality will be assessed at postoperative day 30, as well as long-term (1 year) patient's autonomy and mortality.
- A stepped wedge design will be used involving sequential roll-out of the intervention to clusters of participant centres.
- As in a stepped wedge design, more clusters are exposed to the intervention towards the end of the study than in its early stages, the effect of the intervention might be confounded with any underlying temporal trend.
- The unblinded design of the study may lead to a contamination bias during the control period where investigators may seek to improve their performance and to an information bias related to physicians assessing outcomes by knowing the time

CONSIDERACIONES AGENTE-ESPECÍFICAS CON LA EDAD

INDUCCION		
PROPOFOL	<p>↓ DI 20-50% (1 mg/kg y admin. lenta)</p> <p>Schuttler J. Population pharmacokinetics of propofol. Anesthesiology 2000.</p>	<p>BIC: ↓ D 20-50% (conc. F ↑ 20-30%)</p> <p>Schnider TW. The influence of age on propofol pharmacodynamics. Anesthesiology 1999.</p>
ETOMIDATO	<p>↓ DI 20-50% (≥ 80 a) por ↓ Vd y ↓ Cl.</p>	
BENZODIACEPINAS (MDZ)	<p>↓ D al menos 25% por ↓ Cl. 30% (≥ 80a)</p>	<p>Cerebro del anciano es mucho más sensible al MDZ</p>
DEXMEDETOMIDINA	<p>↓ Cl. 25% (≥ 80a)</p> <p>↑ t_{1/2} sensible al contexto y puede resultar en ↑ sedación</p> <p>Lirola T. Population pharmacokinetics of dexmedetomidine during long-term sedation in intensive care patients. Br J Anaesth 2012.</p>	

CONSIDERACIONES AGENTE-ESPECÍFICAS CON LA EDAD

- **ATRACURIO/CISATRACURIO** duración < variable que **ROCURONIO**

RELAJANTES MUSCULARES	
SUCCINILCOLINA	Colinesterasa que la degrada ↓ pero NO acción prolongada <small>Cope TM. Selecting neuromuscular-blocking drugs for elderly patients. Drugs Aging 2003.</small>
ROCURONIO	OJO en IH / IR !! Puede requerir ajuste dosis <small>Matteo RS. Pharmacokinetics and pharmacodynamics of rocuronium in elderly surgical patients. Anesth Analg 1993.</small>
CISATRACURIO	Duración BNM NO alt. (inicio acción retraso 1´) Elim. vía Hoffmann 80% y esterases plasmáticas Mín. ↑ $t_{1/2}$ elim. (Cl. sin cambios)

CONSIDERACIONES AGENTE-ESPECÍFICAS CON LA EDAD

REVERSORES DE RELAJANTES MUSC.	
ANTI-COLINESTERICOS	<p>OJO: arritmias / retrasos conducción ↔ atropina/glicopirrolato ↑ duración</p> <p>Young WL. Duration of action of neostigmina and pyridostigmine in the elderly. Anesth Analg 1988.</p>
SUGAMMADEX	<p>-$\frac{3}{4}$ F se elimina tal cual en orina</p> <p>NO ajuste dosis (pero individualizar en IR) aunque ↓ Cl. 50%</p> <p>-TOF 0,9: 3,6´ ancianos vs 2,3´ adultos</p> <p>M. Donagh DL. Efficacy, safety and pharmacokinetics of sugammadex for the reversal of rocuronium-induced neuromuscular blockade in elderly patients. Anesthesiology 2011.</p>

CONSIDERACIONES AGENTE-ESPECÍFICAS CON LA EDAD

OPIOIDES: ↑ sensibilidad SNC con la edad (R sobredosis)

FENTANILO
ALFENTANILO
SUFENTANILO

≈ **POTENCIA x 2** (sensib.SNC > cambios F-cinéticos)

Vd = adultos

Ajuste dosis

REMIFENTANILO

Metab: esterasas inespecíficas --- **IDEAL en IR / IH**

↓ Cl. 30%

Ajuste dosis: ↓ 50% bolus y ↓ 30-50% BIC

Minto CF. The influence of age and gender on the pharmacokinetics and pharmacodynamics of remifentanyl. *Anesthesiology* 1997.

MORFINA

Conjugación hepát: Morfina 3-glucurónido (**NEUROTOXICO**) + Morfina 6-glucurónido (**ANALGESICO**). Ambos elim. renal y ↓ Cl.

Ajuste dosis

CONSIDERACIONES AGENTE-ESPECÍFICAS CON LA EDAD

AGENTES INHALADOS: MAC al estímulo quirúrgico ↓ 6% /década

SEVOFLUORANO

Ajuste dosis: MAC 1.48 con ED95 1.98%

Nakajima R. Minimum alveolar concentration of sevoflurane in elderly patients. Br J Anaesth 1993.

DESFLUORANO

↓ **MAC** al 5.1% en ancianos >80a. vs 8.3% adultos

OJO con R taquicardia con ↑ rápidos [DES] !!

MONITORIZACIÓN INTRAOPERATORIA

1. CIRUGÍA MAYOR o CIRUGÍA URGENTE: **PAI** (GAS)
2. Poca evidencia monitorización del **GC** en ancianos.
3. **SrcO₂**: ↓ > 15% es indicativo de isquemia cerebral. Monitorización e intervención precoz puede ↓ POD / POCD.
4. **BIS / monitor de entropía**: recomendado para evitar excesiva profundidad anestésica y prevenir POD / POCD.
5. Uso **TOF** ↑ recomendado.

American Geriatrics Society 2019 Updated AGS Beers Criteria[®] for Potentially Inappropriate Medication Use in Older Adults

Cardiovascular				
Peripheral alpha-1 blockers for treatment of hypertension Doxazosin Prazosin Terazosin	High risk of orthostatic hypotension and associated harms, especially in older adults; not recommended as routine treatment for hypertension; alternative agents have superior risk/benefit profile	Avoid use as an antihypertensive	Moderate	Strong
Amiodarone	Effective for maintaining sinus rhythm but has greater toxicities than other antiarrhythmics used in atrial fibrillation; may be reasonable first-line therapy in patients with concomitant heart failure or substantial left ventricular hypertrophy if rhythm control is preferred over rate control	Avoid as first-line therapy for atrial fibrillation unless patient has heart failure or substantial left ventricular hypertrophy	High	Strong
Anticholinergics ^b				
First-generation antihistamines Brompheniramine Carbinoxamine Chlorpheniramine Clemastine Cypheptadine Dexbrompheniramine Dexchlorpheniramine	Highly anticholinergic; clearance reduced with advanced age, and tolerance develops when used as hypnotic; risk of confusion, dry mouth, constipation, and other anticholinergic effects or toxicity Use of diphenhydramine in situations such as acute treatment of severe allergic reaction may be appropriate.	Avoid	Moderate	Strong

American Geriatrics Society 2019 Updated AGS Beers Criteria[®] for Potentially Inappropriate Medication Use in Older Adults

Benzodiazepines	Older adults have increased sensitivity to benzodiazepines and decreased metabolism of long-acting agents; in general, all benzodiazepines increase risk of cognitive impairment, delirium, falls, fractures, and motor vehicle crashes in older adults	Avoid	Moderate	Strong
<i>Short and intermediate acting:</i>				
Alprazolam				
Estazolam				
Lorazepam				
Oxazepam				
Temazepam	May be appropriate for seizure disorders, rapid eye movement sleep behavior disorder, benzodiazepine withdrawal, ethanol withdrawal, severe generalized anxiety disorder, and procedural anesthesia			
Triazolam				
<i>Long acting:</i>				
Chlordiazepoxide (alone or in combination with amitriptyline or clidinium)				
Clonazepam				
Clorazepate				
Diazepam				
Flurazepam				
Quazepam				

Pain medications				
Meperidine	Oral analgesic not effective in dosages commonly used; may have higher risk of neurotoxicity, including delirium, than other opioids; safer alternatives available	Avoid	Moderate	Strong
Non-cyclooxygenase-selective NSAIDs, oral:				
Aspirin >325 mg/day	Increased risk of gastrointestinal bleeding or peptic ulcer disease in high-risk groups, including those >75 years of age	Avoid chronic use, unless other alternatives are not effective and patient can take gastroprotective agent (proton-pump inhibitor or misoprostol)	Moderate	Strong
Diclofenac	taking oral or parenteral corticosteroids, anticoagulants, or antiplatelet agents; use of proton-pump inhibitor or misoprostol reduces but does not eliminate risk. Upper gastrointestinal ulcers, gross bleeding, or perforation caused by NSAIDs occur in ~1% of patients treated for 3-6 months and in ~2%-4% of patients treated for 1 year; these trends continue with longer duration of use. Also can increase blood pressure and induce kidney injury. Risks are dose related.			
Diflunisal				
Etodolac				
Fenoprofen				
Ibuprofen				
Ketoprofen				
Meclfenamate				
Mefenamic acid				
Meloxicam				
Nabumetone				
Naproxen				

American Geriatrics Society 2019 Updated AGS Beers Criteria[®] for Potentially Inappropriate Medication Use in Older Adults

Central nervous system

Antidepressants, alone or in combination Amitriptyline Amoxapine	Highly anticholinergic, sedating, and cause orthostatic hypotension; safety profile of low-dose doxepin (≤ 6 mg/day) comparable to that of placebo	Avoid	High	Strong
--	--	-------	------	--------

Antipsychotics, first (conventional) and second (atypical) generation	Increased risk of cerebrovascular accident (stroke) and greater rate of cognitive decline and mortality in persons with dementia Avoid antipsychotics for behavioral problems of dementia or delirium unless nonpharmacological options (eg, behavioral interventions) have failed or are not possible and the older adult is threatening substantial harm to self or others	Avoid, except in schizophrenia or bipolar disorder, or for short-term use as antiemetic during chemotherapy	Moderate	Strong
---	---	---	----------	--------

Gastrointestinal

Metoclopramide	Can cause extrapyramidal effects, including tardive dyskinesia; risk may be greater in frail older adults and with prolonged exposure	Avoid, unless for gastroparesis with duration of use not to exceed 12 weeks except in rare cases	Moderate	Strong
Mineral oil, given orally	Potential for aspiration and adverse effects; safer alternatives available	Avoid	Moderate	Strong
Proton-pump inhibitors	Risk of <i>Clostridium difficile</i> infection and bone loss and fractures	Avoid scheduled use for >8 weeks unless for high-risk patients (eg, oral corticosteroids or chronic NSAID use),	High	Strong

TIPO DE ANESTESIA

Z Gerontol Geriat 2014 · 47:110–124 DOI 10.1007/s00391-014-0611-3
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T.J. Luger · C. Kammerlander · M.F. Luger · U. Kammerlander-Knauer · M. Gosch

Mode of anesthesia, mortality and outcome in geriatric patients

Abstract

Background. In older non-cardiac surgery patients, the influence of the mode of anesthesia on late-term outcome (rehabilitation, mobility, independence) is a controversial issue in the medical literature. In light of an aging society, this review assessed the association between regional (RA), local (LA) and general anesthesia (GA) and mortality and morbidity.

Methods. A literature search within the PubMed and Cochrane databases yielded 47 clinical trials and 35 reviews/meta-analyses published between 1965 and 2013. Potential outcome-influencing factors such as mortality, risk factors, early complications (e.g. postoperative confusion, aspiration, vomiting), adverse events (e.g. deep vein thrombosis, pulmonary embolism), discharge, rehabilitation and mobilization were

evaluated in relation to the mode of anesthesia (RA, LA or GA).

Results. The current literature contains 82 references covering 74,476 non-cardiac surgery patients. Analysis shows that the particular mode of anesthesia influences mortality and morbidity. RA is associated with reduced early mortality and morbidity, e.g. fewer incidents of deep vein thrombosis and less acute postoperative confusion, as well as a tendency toward fewer myocardial infarctions and fatal pulmonary embolisms. GA has the advantages of a lower incidence of hypotension and reduced surgery time.

Conclusion. Strictly speaking, true anesthesia-related complications appear to be rare and many adverse outcomes may be multifactorial. Postoperative complications are largely related to the perioperative proce-

dures and not to the anesthesia itself. GA and RA are both useful for older non-cardiac patients, but for some procedures, e.g. hip fracture surgery, RA seems to be the technique of choice. The mode of anesthesia may only play a secondary role in mobility, rehabilitation and discharge destination. In general, due to the many different possible outcomes—which are often very difficult or impossible to compare—no other specific recommendations can be made with regard to the type of anesthesia to be preferred for older non-cardiac patients.

Keywords

Hip fracture · Spinal anesthesia · General anesthesia · Morbidity · Mortality

SHARED DECISION-MAKING WITH OLDER PATIENTS

- Hay que establecer la capacidad del paciente para tomar decisiones --- identificar su representante.
- Bajo entendimiento riesgos / beneficios de la cirugía.
- Considerar los valores, objetivos y miedos del anciano (preferencias tto ?).

- **HIGH RISK SURGERY: “How aggressively care should proceed in the wake of complications ???**
 - ✓ *Medidas de resucitación?*
 - ✓ *Mantenimiento cuidados? L.E.T.?*
 - ✓ *Existe un Documento de voluntades anticipadas?*

GRACIAS

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